Report Information from Dialog DataStar

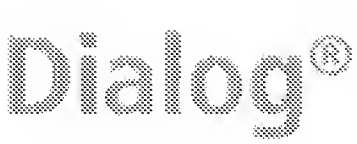

Table of Contents

New adaptive filter for the removal of mixed noise in images with fine detail preservation.

Accession number & update
0008225862 20070101.

Source
WSEAS Transactions on Electronics, {WSEAS–Trans–Electron–Greece}, July 2004, vol. 1, no. 3, p. 537–42, 7 refs, ISSN: 1109–9445. Publisher: WSEAS, Greece.

Author(s)
Saraswathi–Janaki–S, Ebenezer–D.

Author affiliation
Saraswathi Janaki, S., Ebenezer, D., Dept. of Electron. & Commun. Eng., Anna Univ., Chennai, India.

Abstract
In this paper, we developed an algorithm to remove additive mixed noise in images with the preservation of fine details and edges. The noise characteristics may vary in the same application from one image to another. In these environments, nonlinear general **filters** will not perform well and adaptive non–linear **filters** are best suited. The algorithm based on local statistics such as signal **variance** and noise **variance** is considered. It depends on minimum **mean** square estimation of the corrupted signal. The signal **variance** and noise **variance** are calculated through moving signal window and moving noise window respectively. This offers optimal adaptive **filtering** in the homogeneous regions as well as in the edges. The fine detail preservation has been obtained by a combining algorithm. The performance of the **filters** in the presence of different types of noise are evaluated and compared with general **mean,** bidirectional **median filters** and **median filters.** The image enhancement factor has been calculated as the performance–measuring factor. A remotely sensed image has been considered to carryout the subjective and objective analysis of the proposed **filter.**

Descriptors
ADAPTIVE–FILTERS; COVARIANCE–ANALYSIS; IMAGE–DENOISING; IMAGE–ENHANCEMENT; **LEAST–**MEAN–SQUARES–METHODS; **MEDIAN–**FILTERS.

Classification codes
B6135 Optical–image–and–video–signal–processing*;
B6140B **Filtering–**methods–in–signal–processing;
B1270F **Digital–**filters;
B0240Z Other–topics–in–statistics;
B0290F Interpolation–and–function–approximation–numerical–analysis;
C5260B Computer–vision–and–image–processing–techniques*;
C1260S Signal–processing–theory;
C5240 **Digital–**filters;
C1140Z Other–topics–in–statistics;
C4130 Interpolation–and–function–approximation–numerical–analysis.

Keywords
image–noise–removal; fine–detail–preservation; additive–mixed–noise; **nonlinear–**general–filters; **adaptive–**nonlinear–filters; local–statistics; **signal–**variance; **noise–**variance; **minimum–**mean–square–estimation; corrupted–signal; moving–signal–window; moving–noise–window; **bidirectional–**median–filters; image–enhancement.

Treatment codes
P Practical;
T Theoretical–or–mathematical.

Language
English.

Publication type

Journal–paper.

Availability

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Publication year

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Edition

2005001.

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Old pictures restoration and enhancement.

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0007913745 20070101.

Conference information

Proceedings of the Twentieth National Radio Science Conference (NRSC'2003), Cairo, Egypt, 18–20 March 2003.

Source

Proceedings of the Twentieth National Radio Science Conference (NRSC'2003) (IEEE Cat. No.03EX665), 2003, p. C2–1–10, 9 refs, pp. 688. Publisher: Acad. Sci. Res. & Technol, Cairo, Egypt.

Author(s)

Hadhoud–M–M, El–Ramly–N–A, Gaballa–L–N, Ibrahim–H–M, Ahmed–Mohamed–M.

Author affiliation

Hadhoud, M.M., Fac. of Comput. & Inf., Menoufia Univ.

Abstract

Old pictures records scenes and features of historical events. Due to aging, improper handling, and changes of chemicals used in producing the image, these images deteriorate. This paper reports the results of an ongoing study of applying image processing methods in the restoration and enhancement of old pictures. The process is not straightforward because of many difficulties both in the image itself and in the method and the format used to transfer the image into the computer. The process of image recording produces a noise and the format used to record the image also affects the final result. The type and model of noise on these old pictures is unknown. This paper studies the noise characteristics. The most important result obtained proposes a signal dependent noise model for the noise in old pictures. This result is important in identifying the proper method to be used in noise **filtering.** The paper also applies and compares the results of some traditional and modified image **filtering** methods. Traditional **filtering** methods such as low pass **averaging, median filtering** and adaptive **filtering** are used. Results are presented to illustrate the effect of these **filtering** methods.

Descriptors

ADAPTIVE–FILTERS; IMAGE–DENOISING; IMAGE–ENHANCEMENT; IMAGE–RESTORATION; **MEDIAN–**FILTERS; NOISE.

Classification codes

B6135 Optical–image–and–video–signal–processing*;
B6140B **Filtering–**methods–in–signal–processing;
C5260B Computer–vision–and–image–processing–techniques*.

Keywords

image–processing; old–pictures–restoration; old–pictures–enhancement; image–recording; noise–characteristics; signal–dependent–noise–model; **noise–**filtering; **image–**filtering–methods; **low–**pass–averaging; **median–filtering; adaptive–**filtering; **variance–**ratio–estimator.

Treatment codes

P Practical;
T Theoretical–or–mathematical.

Language
English.

Publication type
Conference–paper.

Publication year
2003.

Publication date
20030000.

Edition
2004013.

Wavelet–domain iterative center weighted median filter for image denoising.

Dialog eLinks
Full text options USPTO Full Text Retrieval Options

Accession number & update
0007703120 20070101.

Source
Signal Processing, {Signal–Process–Netherlands}, May 2003, vol. 83, no. 5, p. 1001–12, 14 refs, CODEN: SPRODR, ISSN: 0165–1684. Publisher: Elsevier for EURASIP, Netherlands.

Author(s)
Rahman–S–M–M, Hasan–M–K.

Author affiliation
Rahman, S.M.M., Hasan, M.K., Dept. of Electr. & Electron. Eng., Bangladesh Univ. of Eng. & Technol., Dhaka, Bangladesh.

Abstract
A new **median filter** termed the iterative center weighted **median filter** (ICWMF) in the wavelet coefficient domain is proposed for image denoising. Exploiting both inner– and inter–scale dependencies of the image wavelet coefficients, an improved estimation of the **variance** field is obtained using the proposed **filter.** This **filter** iteratively smoothes the noisy wavelet coefficients' **variances** preserving the edge information contained in the large magnitude wavelet coefficients. The **variance** field estimated using the ICWMF is then used in a minimum **mean–**square error estimator to denoise the noisy image wavelet coefficients. Simulation results show that higher peak–signal–to–noise ratio can be obtained as compared to other recent image denoising methods.

Descriptors
IMAGE–DENOISING; ITERATIVE–METHODS; **LEAST–**MEAN–SQUARES–METHODS; **MEDIAN–**FILTERS; PARAMETER–ESTIMATION; SMOOTHING–METHODS; STATISTICAL–ANALYSIS; WAVELET–TRANSFORMS.

Classification codes
B6135 Optical–image–and–video–signal–processing*;
B6140B **Filtering–**methods–in–signal–processing;
B0290F Interpolation–and–function–approximation–numerical–analysis;
B0240Z Other–topics–in–statistics;
B0290X Integral–transforms–in–numerical–analysis;
C5260B Computer–vision–and–image–processing–techniques*;
C1260S Signal–processing–theory;
C1140Z Other–topics–in–statistics;
C4188 Integral–transforms–in–numerical–analysis;
C4130 Interpolation–and–function–approximation–numerical–analysis.

Keywords
iterative–center–weighted–median–filter; image–denoising; inner–scale–dependencies; inter–scale–dependencies; **variance–**field–estimation; iterative–smoothing; edge–information–preservation; noisy–wavelet–**coefficient–**variances; large–magnitude–wavelet–coefficients; statistical–modeling; ICWMF; **minimum–**mean–square–error–estimator; peak–signal–to–noise–ratio.
Treatment codes
T Theoretical–or–mathematical;
X Experimental.
Language
English.
Publication type
Journal–paper.
Availability
SICI: 0165–1684(200305)83:5L.1001:WDIC; 1–4.
CCCC: 0165–1684/03/$30.00.
Digital object identifier
10.1016/S0165–1684(02)00502–9.
Publication year
2003.
Publication date
20030500.
Edition
2003030.

Robustness of nonlinear filters for image processing.

Accession number & update
0007022389 20070101.
Source
Journal of Electronic Imaging, {J–Electron–Imaging–USA}, July 2001, vol. 10, no. 3, p. 744–56, 14 refs, CODEN: JEIME5, ISSN: 1017–9909. Publisher: SPIE–Int. Soc. Opt. Eng, USA.
Author(s)
Peltonen–S, Kuosmanen–P.
Author affiliation
Peltonen, S., Kuosmanen, P., Signal Process. Lab., Tampere Univ., Finland.
Abstract
In this paper we study robustness of nonlinear **filters** for image processing by using a recently introduced method called output distributional influence function (ODIF). Unlike the traditionally used asymptotic methods, such as the influence function and the **change–**of–variance function, the ODIF provides information about the robustness of finite length **filters** used in image processing. The ODIF is not only a good theoretical analysis tool but it can also be used in real **filtering** situations for selecting **filters** behaving as desired in the presence of contamination. The applicability of the ODIF to the real image processing tasks is validated by experiments on images. We present the ODIFs for stack and **L–**filters which include many of the **filters** useful in the image processing applications. The usefulness of the ODIF in the analysis of the robustness of different **filters** is demonstrated in several illustrative examples by using the ODIFs for the expectation and **variance.**
Descriptors

IMAGE–PROCESSING; **NONLINEAR–**FILTERS; **STACK–**FILTERS.

Classification codes

B6135 Optical–image–and–video–signal–processing*;
B6140B **Filtering–**methods–in–signal–processing;
C5260B Computer–vision–and–image–processing–techniques*.

Keywords

nonlinear–filters; image–processing; output–distributional–influence–function; **finite–**length–filters–robustness; ODIF; contamination; **stack–**filters; **L–**filters; **optimal–**filter; **median–**filters; **mean–filters;** expectation; **variance–**function.

Treatment codes

T Theoretical–or–mathematical;
X Experimental.

Language

English.

Publication type

Journal–paper.

Availability

SICI: 1017–9909(200107)10:3L.744:RNFI; 1–I.
CCCC: 1017–9909/2001/$15.00.
Publisher identity number: S1017–9909(01)01603–8.

Digital object identifier

10.1117/1.1380388.

Publication year

2001.

Publication date

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Edition

2001034.

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Estimation of noise component in satellite images and its application.

Accession number & update

0005112730 20070101.

Conference information

1995 International Geoscience and Remote Sensing Symposium, IGARSS '95. Quantitative Remote Sensing for Science and Applications,
Firenze, Italy, 10–14 July 1995.
Sponsor(s): IEEE Geosci. & Remote Sensing Soc; URSI.

Source

1995 International Geoscience and Remote Sensing Symposium, IGARSS '95. Quantitative Remote Sensing for Science and Applications (Cat. No.95CH35770), 1995, vol.1, p. 102–4 vol.1, 5 refs, pp. 3 vol. lxvi +2331, ISBN: 0–7803–2567–2. Publisher: IEEE, New York, NY, USA.

Author(s)

Iikura–Y. Editor(s): Stein–T–I.

Author affiliation

Iikura, Y., Dept. of Comput. & Inf. Sci., Iwate Univ., Morioka, Japan.

Abstract

The **median filter** is known to be effective to estimate the amount of noise present in the image. The authors investigate its performance quantitatively, and it is compared with the Laplacian **filter** and the trimmed **mean filter.** The estimated **variances** are adjusted to give an unbiased estimate under ideal

conditions with no structure in the image. It is also shown that the trimmed **mean filter** as well as the **median filter** are robust to simple line edge structures. The author also discusses the estimation of the covariance matrix of the noise component with interband correlation, which is useful in many algorithms for image processing, such as edge detection, data compression, and image enhancement.

Descriptors

CORRELATION–METHODS; COVARIANCE–MATRICES; DATA–COMPRESSION; EDGE–DETECTION; GEOPHYSICAL–SIGNAL–PROCESSING; IMAGE–CODING; IMAGE–ENHANCEMENT; INTERFERENCE–SIGNAL; **MEDIAN–**FILTERS; REMOTE–SENSING.

Classification codes

A9385 Instrumentation–and–techniques–for–geophysical–hydrospheric–and–lower–atmosphere–research*;
A9365 Data–and–information–acquisition–processing–storage–and–dissemination–in–geophysics;
B7710 Geophysical–techniques–and–equipment*;
B6140C Optical–information–image–and–video–signal–processing;
B6120B Codes;
B0290H Linear–algebra–numerical–analysis.

Keywords

noise–component; satellite–images; **median–**filter; performance; **Laplacian–**filter; **trimmed–**mean–filter; **estimated–**variances; line–edge–structures; covariance–matrix; interband–correlation; image–processing; edge–detection; data–compression; image–enhancement.

Treatment codes

T Theoretical–or–mathematical.

Language

English.

Publication type

Conference–paper.

Availability

CCCC: 0 7803 2567 2/95/$4.00.

Digital object identifier

10.1109/IGARSS.1995.519660.

Publication year

1995.

Publication date

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Edition

1995045.

Copyright statement

Copyright 1995 IEE.

Median–style filters for noise reduction in composition analyses.

Dialog eLinks

Full text options USPTO Full Text Retrieval Options

Accession number & update

0004661011 20070101.

Conference information

IFES '93. 40th International Field Emission Symposium, Nagoya, Japan, 2–6 Aug. 1993.
Sponsor(s): Ministr. Educ. Japan; Commemorative Assoc. Japan World Exposition.

Source

Applied Surface Science, {Appl–Surf–Sci–Netherlands}, March 1994, vol. 76–77, p. 416–23, 11 refs, CODEN: ASUSEE, ISSN: 0169–4332, Netherlands.

Author(s)

Camus–P, Larson–D–J.

Author affiliation

Camus, P., Larson, D.J., Appl. Supercond. Center, Wisconsin Univ., Madison, WI, USA.

Abstract

Several commonly applied techniques for atom probe data noise reduction are compared to signal processing techniques specifically designed to maintain interfacial integrity. A **median filter** and a double–window modified trimmed **mean filter,** along with several other **filters,** are applied to both a simulated atom probe composition profile and to real atom probe data. The various methods are compared using **average** profile compositions and **variance** measurements. The double–window modified trimmed **mean filter** is found to smooth the data in the slowly varying regions of the profile without degrading sharp interfaces.

Descriptors

ATOM–PROBE–FIELD–ION–MICROSCOPY; **FILTERING–**AND–PREDICTION–THEORY; RANDOM–NOISE.

Classification codes

A8280M Mass–spectrometry–chemical–analysis*;
A0780 Electron–and–ion–microscopes–and–techniques;
A6116F Field–ion–microscopy–determinations–of–structures–atom–and–ion–scattering–techniques;
A0650D Data–gathering–processing–and–recording–data–displays–including–digital–techniques.

Keywords

composition–analyses; atom–probe–data–noise–reduction; signal–processing; interfacial–integrity; **median**–filter; double–window–**modified–**trimmed–mean–filter; simulated–composition–profile; **variance–**measurements; data–smoothing; **average**–profile–compositions.

Treatment codes

T Theoretical–or–mathematical.

Language

English.

Publication type

Conference–paper; Journal–paper.

Availability

CCCC: 0169–4332/94/$07.00.

Publication year

1994.

Publication date

19940300.

Edition

1994016.

Copyright statement

Analysis of speckle interferometry images.

Dialog eLinks

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Accession number & update

0004423782 20070101.

Conference information

Optical Information Processing Systems and Architectures IV, San Diego, CA, USA, 20–21 July 1992.
Sponsor(s): SPIE.

Source

Proceedings of the SPIE – The International Society for Optical Engineering, {Proc–SPIE–Int–Soc–Opt–Eng–USA}, 1993, vol. 1772, p. 265–75, 5 refs, CODEN: PSISDG, ISSN: 0277–786X, USA.

Author(s)

Tofsted–D–H.

Author affiliation

Tofsted, D.H., US Army Atmos. Sci. Lab., White Sands Missile Range, NM, USA.

Abstract

Speckle interferometry provides a basis for analyzing the dynamic motions of materials through differencing of the fields scattered from objects at two different times. Phase differences in the signals measured at different times, inferred from fringe patterns, indicate the degree of deformation present. Automatic analysis of differenced images requires significant preprocessing to enhance the contrast of fringe regions. Often fringes that are evident to the human eye cannot be perceived automatically because the fringes usually consist of widely separated high intensity spikes. **Median** or **averaging filters** are ineffective at enhancing these patterns. Adaptive **filtering** similar to that used in SAR image analysis is capable of enhancing the fringe area contrast. A two step process is detailed. In a first phase a **filter** based on window **mean** and **variance** suppresses noise and generates a greater cohesion of high intensity points in the fringe areas. In a second phase the image is **average filtered** to smooth the intensities in the fringes. An auxiliary routine used to count fringes is discussed. Comparisons with **median filtered** results show the greater ability to automatically count fringes using this two step method.

Descriptors

ADAPTIVE–OPTICS; LIGHT–INTERFEROMETRY; **SPATIAL–**FILTERS; SPECKLE.

Classification codes

A0760L Optical–interferometry*;
A4230V Image–processing–and–restoration;
A4280B **Spatial–**filters–zone–plates–and–polarizers.

Keywords

adaptive–filtering; automatic–analysis; scattered–field–differencing; fringe–region–contrast; speckle–interferometry–images; dynamic–motions; deformation; preprocessing; high–intensity–spikes; two–step–process; noise; two–step–method.

Treatment codes

X Experimental.

Language

English.

Publication type

Conference–paper; Journal–paper.

Availability

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Publication year

1993.

Publication date

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Edition

1993023.

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Copyright 1993 IEE.

Edge adaptive filtering: how much and which direction?

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0003719661 20070101.

Conference information
1989 IEEE International Conference on Systems, Man and Cybernetics. Conference Proceeding. (Cat. No.89CH2809–2), Cambridge, MA, USA, 14–17 Nov. 1989.
Sponsor(s): IEEE.

Source
1989 IEEE International Conference on Systems, Man and Cybernetics. Conference Proceeding. (Cat. No.89CH2809–2), 1989, p. 364–6 vol.1, 4 refs, pp. 3 vol. 1300. Publisher: IEEE, New York, NY, USA.

Author(s)
Jha–R, Jernigan–M–E.

Author affiliation
Jha, R., Jernigan, M.E., Dept. of Syst. Design Eng., Waterloo Univ., Ont., Canada.

Abstract
A novel adaptive **filter** for edge–preserving smoothing of noisy images is introduced. The novelty of the **filter** is that its region of support is tuned simultaneously in its size and orientation. An edge strength measure is extracted from the local **variance** and used to control the size of the window. The gradient direction is used to adapt the orientation of the window. The use of both edge strength and edge detection information allows large windows to be used even in the vicinity of edges. The **filter** has been tested for additive white Gaussian noise with the **mean** as the point estimator over local windows, and for additive white impulse noise with the **median** as the point estimator. Results, particularly for the adaptive **median filter,** are very promising. The results show that the **filter** does greater smoothing in the vicinity of edges without compromising performance away from edges and the edge structure of the image.

Descriptors
ADAPTIVE–FILTERS; **FILTERING**–AND–PREDICTION–THEORY; PICTURE–PROCESSING.

Classification codes
B6140C Optical–information–image–and–video–signal–processing*;
C1250 Pattern–recognition*.

Keywords
adaptive–filter; edge–preserving–smoothing; noisy–images; gradient–direction; edge–detection; white–Gaussian–noise.

Treatment codes
T Theoretical–or–mathematical.

Language
English.

Publication type
Conference–paper.

Availability
CCCC: CH2809–2/89/0000–0364$01.00.

Digital object identifier
10.1109/ICSMC.1989.71318.

Publication year
1989.

Publication date
19890000.

Edition
1990020.

Copyright statement

An adaptive technique for digital noise suppression in on–line portal imaging.

Dialog eLinks

Full text options USPTO Full Text Retrieval Options

Accession number & update

0003645860 20070101.

Source

Physics in Medicine and Biology, {Phys–Med–Biol–UK}, March 1990, vol. 35, no. 3, p. 429–39, 15 refs, CODEN: PHMBA7, ISSN: 0031–9155, UK.

Author(s)

Leszczynski–K–W, Shalev–S, Scott–Cosby–N.

Author affiliation

Leszczynski, K.W., Shalev, S., Dept. of Phys., Manitoba Univ., Winnipeg, Man., Canada.

Abstract

Two complementary approaches to the noise suppression problem in on– line portal imaging have been analysed. Temporal **filtering** by image summation can substantially reduce the amount of noise in an image. In many cases, however, movements of the patient or the radiation source limit the time period over which the **averaging** can be done. Any remaining noise has to be dealt with by applying spatial **filtering.** The adaptive Lee **filter** is particularly suitable for portal imaging applications. The authors have proposed a modification to the basic Lee technique which permits the calculation of the noise **variance** locally by utilising the information contained in intermediate images acquired during frame **averaging.** Unlike the original Lee formulation, no a priori knowledge of the noise **variance** is required, and in contrast to Mastin's approach (Mastin 1985), the **variance** may vary with position in the image. The tests of performance of the modified Lee **filter,** carried out using on–line images, have shown its superiority in comparison with the original Lee technique as well as with conventional **averaging** and **median filters.**

Descriptors

ADAPTIVE–FILTERS; COMPUTERISED–PICTURE–PROCESSING; MEDICAL–COMPUTING; NOISE; RADIATION–THERAPY; RADIOGRAPHY.

Classification codes

A8760J X–rays–and–particle–beams–medical–uses*;
A8770G Patient–care–and–treatment;
C7330 Biology–and–medical–computing*;
C5260B Computer–vision–and–image–processing–techniques.

Keywords

temporal–filtering; patient–movement; radiation–source–movement; radiation–therapy; adaptive–technique; digital–noise–suppression; on–line–portal–imaging; image–summation; time–period; **averaging;** spatial–**filtering; adaptive–**Lee–filter; **noise–**variance; intermediate–images; **frame–**averaging; **modified–**Lee–filter.

Treatment codes

T Theoretical–or–mathematical.

Language

English.

Publication type

Journal–paper.

Availability

CCCC: 0031–9155/90/030429+11$03.50.

Digital object identifier

10.1088/0031–9155/35/3/011.

Publication year

1990.

Publication date

19900300.

Edition

1990013.

Copyright statement

Rank filters in digital image processing.

Dialog eLinks

Full text options USPTO Full Text Retrieval Options

Accession number & update

0001933733 20070101.

Source

Computer Graphics and Image Processing, {Comput–Graph–Image–Process– USA}, June 1982, vol. 19, no. 2, p. 148–64, 22 refs, CODEN: CGIPBG, ISSN: 0146–664X, USA.

Author(s)

Heygster–G.

Author affiliation

Heygster, G., Rechenzentrum, Univ. der Bremen, Bremen.

Abstract

Rank **filters** operating on images assign the kth value of the gray levels from the window consisting of M pixels arranged according to their value to the center point of the window. The special cases k=1, k=M (MIN and MAX **filter)** and k=(M+1)/2 (medium **filter)**, which have already been applied in image processing, are investigated in systematic connection with all rank **filters.** Some of their properties can be formulated analytically. They commute with monotonic transforms of the gray scale. In the one–dimensional case–also valid for line– like structures in images–the output functions of monotonic input functions can be calculated directly. The alternating application of MIN and MAX **filters** leads, if repeated more than once, to the same result as a single application. The application of the rank **filters** to a set of test images shows that there is no simple way to describe their action on the spectrum by means of a transfer or autocorrelation function. In particular the smoothing of the **median filter** cannot be described in terms of a low–pass **filter,** but rather by the reduction of the **mean** local **variance.** As shown on real and statistical model images, rank **filters** smooth less than linear **filters,** but preserve edges.

Descriptors

FILTERING–AND–PREDICTION–THEORY; PICTURE–PROCESSING.

Classification codes

B6140C Optical–information–image–and–video–signal–processing*;
C1250 Pattern–recognition*;
C1260 Information–theory;
C5260 Digital–signal–processing.

Keywords

filtering–and–prediction–theory; digital–image–processing; gray–levels; pixels; **rank–**filters; autocorrelation–function; smoothing; **low–**pass–filter; **mean–**local–variance.

Treatment codes

T Theoretical–or–mathematical.

Language

English.

Publication type

Journal–paper.

Publication year

1982.

Publication date

19820600.

Edition

1982011.

Copyright statement

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Search Strategy

No.	Database	Search term	Info added since	Results
1	INZZ	varianc$2 AND (mean OR averag$3)	unrestricted	16372
2	INZZ	(impuls$3 OR photon$2 OR poisson) ADJ noise	unrestricted	4896
3	INZZ	median ADJ filter$3	unrestricted	3177
4	INZZ	filter$3	unrestricted	319301
5	INZZ	1 AND 3	unrestricted	33
6	INZZ	1 AND 2 AND 3	unrestricted	1

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